A large international study has discovered 60 genetic variants that link low birth weight to an increased risk of high blood pressure, type 2 diabetes, and heart disease.

Scientists have discovered 60 genetic variants that can both affect birth weight and increase the risk of developing type 2 diabetes, heart disease, and high blood pressure, later in life.

The study gives new insights into how apparently unrelated diseases are linked via our genes.

“It’s fascinating to see that the genes that play a role in birth weight also play a role in different diseases. By studying these genes, we can also see which proteins are involved and shine a spotlight on the mechanisms that can lead to these diseases,” says co-author Hans Bisgaard, professor of pediatrics and the head of the Copenhagen Studies on Asthma in Childhood research center (COPSAC) at the University of Copenhagen, Denmark.

“It’s a serious step towards understanding this disease and to find out how we can remedy them,” says Bisgaard.

The study is published in the scientific journal Nature.

60 new genetic variations

In the new study, scientists from 116 different research centres around the world have worked together to create a gigantic database. They compared the genes of 153,000 people with their birth weight and the risk of developing a range of metabolic diseases.

“We’ve long suspected that birth weight influences the risk of developing different diseases later in life. In this study, we found the genetic variants that influence birth weight, and used them to find the genes that also predisposes us to heart disease, blood pressure disorders, and type 2 diabetes,” says Bisgaard.

The study took a two-pronged approach. First, the scientists used genomes and birth weight to identify relevant gene variants. Then they looked to see if the newly discovered genetic variants were overly represented in people with these diseases.

“We knew of five or six genetic variants that could be associated with birth weight, but we have now increased this to 60. Traditionally, scientists have interpreted birth weight as a result of environmental factors early in life. But here we show some specific genes help to decide birth weight and could be linked to risks of developing different diseases as adults,” says Bisgaard.

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Anders Børglum is a professor in medical genetics and disease. He was not involved in the new study.

He describes the results as exciting and notes that it is much larger than previous studies on the subject. The results are very strong, he says.

“It gives very strong support to identify which genes influence birth weight and then to see how they correlate with diseases later in life. And it’s exciting to see that numerous genetic variants, which are common in the population, can explain 15 per cent of variability in birth weight. That’s a considerable amount,” says Børglum.

He notes that the study actually indicates that children with a lower birth weight are also less likely to become overweight.

“Obesity is generally linked to an increased risk of these diseases. The study gives an insight into some of the mechanisms and some areas that we need to study further to understand the causes of both obesity and these more widespread diseases,” says Børglum.

Read the Danish story on Videnskab.dk [9]